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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,001	07/15/2003	Yasuaki Tsuchiya	8017-1095	6042

466 7590 08/04/2005

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EXAMINER	
KENNEDY, JENNIFER M	
ART UNIT	**PAPER NUMBER**
2812	

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/619,001	TSUCHIYA ET AL.
	Examiner	Art Unit
	Jennifer M. Kennedy	2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 6-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha et al. (U.S. Patent No. 6,551,935) in view of Watts et al. (Japanese Patent Application Laid open No. 11-238709, provided in IDS).

In re claim 1 and 9, Sinha et al. disclose the method of manufacturing a semiconductor device, comprising the steps of:

forming a sunken section (see Figure 2) in a film formed on a substrate (12);

forming a barrier metal film (18) on said insulating film inclusive of said sunken section;

forming a copper based film (20) over the entire surface so as to fill up said sunken section; and

forming a copper based metal interconnection, which comprises the step of polishing this substrate surface by the chemical mechanical polishing method, using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight

ratio)) is 5 to 8 (see column 5, lines 50 through column 6, line 40 and column 9, lines 14-23).

The examiner notes that the weight percent ranges of amino acid and triazole based compounds taught in Sinha et al. include the claimed weight percent ratio.

Sinha et al. does not explicitly disclose that the sunken region is formed in an insulative film. Sinha et al. does disclose that an insulating film underlies the barrier and copper films that are being polished (see column 6, lines 10-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the sunken in region in an insulative layer because it allows for isolation of the copper lines in an interconnect which prevents shorting.

Sinha et al. disclose the method as claimed and rejected above including some examples of triazoles, but does not disclose the method wherein the triazole based compound is a 1,2,4 triazole or its derivative. Watts et al. teaches the method of using a 1,2,4 triazole or its derivative (see specification of instant application, page 3, line 23 through line 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a 1,2,4 triazole or its derivative since Watts et al. teaches that a 1,2,4 triazole may be used as a corrosion inhibitor and since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

In re claim 2, Sinha et al. disclose the method of manufacturing a semiconductor device, comprising the steps of:

forming a sunken section (see Figure 2) in a film formed on a substrate (12);

forming a barrier metal film (18) on said insulating film inclusive of said sunken section;

forming a copper based film (20) over the entire surface so as to fill up said sunken section; and

polishing this substrate surface by the chemical mechanical polishing method to for a copper-based metal interconnection, wherein said step of polishing comprises the steps of:

a first polishing which is performed until at least a part of said barrier metal film is exposed, while using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid triazole-based compound (weight ratio)) is 5 to 8 (see column 5, lines 50 through column 6, line 40 and column 9, lines 14-23); and

a second polishing which is performed until the surface of the insulating film other than said sunken section is exposed (see Figure 5).

The examiner notes that the weight percent ranges of amino acid and triazole based compounds taught in Sinha et al. include the claimed weight percent ratio.

Sinha et al. does not explicitly disclose that the sunken region is formed in an insulative film. Sinha et al. does disclose that an insulating film underlies the barrier and

copper films that are being polished (see column 6, lines 10-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the sunken in region in an insulative layer because it allows for isolation of the copper lines in an interconnect which prevents shorting.

In re claim 3, Sinha et al. disclose the method as claimed and rejected above in a first embodiment, but do not the method wherein said barrier metal film is a tantalum-based metal film. Sinha et al. disclose in another embodiment the method wherein said barrier metal film is a tantalum based metal film (see column 1, lines 40-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the barrier metal film of Sinha et al. first embodiment with tantalum nitride because as Sinha et al. teaches tantalum is a suitable material and that it is interchangeable with tungsten (see column 1 line 40 through column 2, line 15) and because it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

In re claim 4, Sinha et al. disclose the method wherein the amino acid is glycine (see column 6, lines 25-30).

In re claims 7, 10, and 11, Sinha et al. disclose the method wherein a pH value of said polishing slurry is in a range of 5 to 7 (see column 6, lines 5-8).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha et al. (U.S. Patent No. 6,551,935) and Watts et al. (Japanese Patent Application Laid

open No. 11-238709, provided in IDS) in view of Asano et al. (U.S. Patent No. 6,679,929).

In re claim 8, Sinha et al. disclose the method as claimed and rejected above, but does not disclose the method wherein said silica polishing material is colloidal silica. Asano et al. disclose the method of using colloidal silica as the abrasive material for a polishing slurry (see column 3, lines 58-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize colloidal silica because as Asano et al. teach it is a preferred material for an abrasive in a polishing slurry and because it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Claims 1-4, and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bendik, Jr. et al. (U.S. Patent No. 6,214,721) in view of Wang et al. (U.S. Patent Appl. No. 2003/0166337).

In re claim 1 and 9, Bendik Jr. et al. disclose the method of manufacturing a semiconductor device, comprising the steps of:

forming a sunken section (see column 2, lines 63-66) in a insulating film (18, 14) formed on a substrate (12);

forming a barrier metal film (TaN liner, 15) on said insulating film inclusive of said sunken section;

forming a copper based film (20) over the entire surface so as to fill up said sunken section; and

forming a copper based metal interconnection, which comprises the step of polishing this substrate surface by the chemical mechanical polishing method (see column 2, line 64 through column 3, line 3).

Bendik Jr. et al. do not disclose the method of using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight ratio)) is 5 to 8, and wherein said triazole-based compound is one of 1,2,3-triazole , 1,2,4-triazole and their derivatives.

Wang et al. teach using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight ratio)) is 5 to 8 and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives (see [0023-0027] and [0033-0039]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the slurry of Wang et al. in the method of Bendik, Jr. et al. because as Wang et al. teaches the slurry allows for polishing multiple layers at similar or dissimilar rates and selectivities in order to improve planarization (see Wang et al. [0010]).

The examiner notes that the amino acid is added in a range from about 0.05 to 10.0 wt% in [0027] and that the inhibitor of 1,2,3-triazole, 1,2,4-triazole is added to an amount of 0.005 to 1 wt% [0033-0034]. Therefore, Wang et al. disclose at least one point (amino acid of 0.05 wt % and the inhibitor of 0.08 wt %) a 5:8 ratio of amino acid/azole inhibitor compound.

In re claim 2, Bendik Jr. et al. disclose the method of manufacturing a semiconductor device, comprising the steps of:

forming a sunken section (see column 2, lines 63-66) in a insulating film (18, 14) formed on a substrate (12);

forming a barrier metal film (TaN liner, 15) on said insulating film inclusive of said sunken section;

forming a copper based film (20) over the entire surface so as to fill up said sunken section; and

polishing this substrate surface by the chemical mechanical polishing method to for a copper-based metal interconnection (see column 2, line 64 through column 3, line 3).

Bendik Jr. et al. do not disclose the method of performing a first polishing until at least a part of said barrier metal is exposed, while using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound

(amino acid to said triazole-based compound (weight ratio)) is 5 to 8, and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives and a second polishing which is performed until the surface of the insulating film other than said sunken section is exposed.

Wang et al. teach performing a first polishing until at least a part of said barrier metal is exposed, while using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight ratio)) is 5 to 8, and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives and a second polishing which is performed until the surface of the insulating film other than said sunken section is exposed (see [0023-0027] and [0033-0039] for composition and [0041]-[0044] for first and second polishing).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the slurry of Wang et al. in the method of Bendik, Jr. et al. because as Wang et al. teaches the slurry allows for polishing multiple layers at similar or dissimilar rates and selectivities in order to improve planarization (see Wang et al. [0010]).

The examiner notes that the amino acid is added in a range from about 0.05 to 10.0 wt% in [0027] and that the inhibitor of 1,2,3-triazole, 1,2,4-triazole is added to an amount of 0.005 to 1 wt% [0033-0034]. Therefore, Wang et al. disclose at least one

point (amino acid of 0.05 wt % and the inhibitor of 0.08 wt %) a 5:8 ratio of amino acid/azole inhibitor compound.

In re claim 3, Bendik Jr. et al. disclose the method wherein said barrier metal film is a tantalum-based metal film (15).

In re claim 4, the combined Bendik Jr. et al. and Wang et al. disclose the method as claimed and rejected, but do not disclose the method wherein the amino acid is glycine.

Wang et al. disclose in another embodiment the method wherein said amino acid can be glycine (see [0045]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize glycine in the method of Wang et al. Wang et al. glycine is a known amino acid utilized in CMP slurries that allow for faster CMP of copper (see [0047]) and because it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

In re claim 6, Wang et al. disclose the method wherein a content of said triazole-based compound is not less than 0.05% by weight, but not greater than 0.5% by weight. For example, when amino acid 0.05 wt% and the inhibitor at 0.08 wt% reads on this limitation.

In re claims 7, 10, and 11, Wang et al. disclose the method wherein a pH value of said polishing slurry is in a range of 5 to 7 (see [0046], and Table 1, and Table 2) and further teaches the pH may be adjusted. The examiner notes that Applicant does not teach that the pH range solves any stated problem or is for any particular purpose.

Therefore, the pH range lacks criticality in the claimed invention and does not produce unexpected or novel results. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the slurry with a pH range of 5-7 because Wang teaches any pH may be adjusted, and because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233, MPEP 2144.05 II A.

In re claim 8, Wang et al. disclose the method wherein said silica polishing material is colloidal silica (see [0035]).

Claims 1-4, and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lai et al. (U.S. Patent No. 6,136,680) in view of Wang et al. (U.S. Patent Appl. No. 2003/0166337).

In re claim 1 and 9, Lai et al. disclose the method of manufacturing a semiconductor device, comprising the steps of:

forming a sunken section (see Figure 2) in a insulating film (16) formed on a substrate (10);

forming a barrier metal film (20) on said insulating film inclusive of said sunken section;

forming a copper based film (24) over the entire surface so as to fill up said sunken section; and

forming a copper based metal interconnection, which comprises the step of polishing this substrate surface by the chemical mechanical polishing method. (see column 6, lines 30-60).

Lai et al. do not disclose the method of using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight ratio)) is 5 to 8, and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives.

Wang et al. teach using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight ratio)) is 5 to 8 and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives (see [0023-0027] and [0033-0039]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the slurry of Wang et al. in the method of Lai et al. because as Wang et al. teaches the slurry allows for polishing multiple layers at similar or dissimilar rates and selectivities in order to improve planarization (see Wang et al. [0010]).

The examiner notes that the amino acid is added in a range from about 0.05 to 10.0 wt% in [0027] and that the inhibitor of 1,2,3-triazole, 1,2,4-triazole is added to an amount of 0.005 to 1 wt% [0033-0034]. Therefore, Wang et al. disclose at least one

point (amino acid of 0.05 wt % and the inhibitor of 0.08 wt %) a 5:8 ratio of amino acid/azole inhibitor compound.

In re claim 2, Lai et al. disclose the method of manufacturing a semiconductor device, comprising the steps of:

forming a sunken section (see Figure 2) in a insulating film (16) formed on a substrate (10);

forming a barrier metal film (20) on said insulating film inclusive of said sunken section;

forming a copper based film (24) over the entire surface so as to fill up said sunken section; and

polishing this substrate surface by the chemical mechanical polishing method to for a copper-based metal interconnection, wherein said step of polishing comprises the steps of a first polishing which is performed until at least a part of said barrier metal film is exposed, and a second polishing which is performed until the surface of the insulating film other than said sunken section is exposed (see column 6, lines 30-60).

Lai et al. do not disclose the method of performing a first polishing until at least a part of said barrier metal is exposed, while using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound

(amino acid to said triazole-based compound (weight ratio)) is 5 to 8, and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives.

Wang et al. teach performing a first polishing until at least a part of said barrier metal is exposed, while using a polishing slurry containing a silica polishing material, an oxidizing agent, and amino acid, a triazole-based compound and water, wherein a content ratio of said amino acid to said triazole-based compound (amino acid to said triazole-based compound (weight ratio)) is 5 to 8, and wherein said triazole-based compound is one of 1,2,3-triazole, 1,2,4-triazole and their derivatives and a second polishing which is performed until the surface of the insulating film other than said sunken section is exposed (see [0023-0027] and [0033-0039] for composition and [0041]-[0044] for first and second polishing).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the slurry of Wang et al. in the method of Lai et al. because as Wang et al. teaches the slurry allows for polishing multiple layers at similar or dissimilar rates and selectivities in order to improve planarization (see Wang et al. [0010]).

The examiner notes that the amino acid is added in a range from about 0.05 to 10.0 wt% in [0027] and that the inhibitor of 1,2,3-triazole, 1,2,4-triazole is added to an amount of 0.005 to 1 wt% [0033-0034]. Therefore, Wang et al. disclose at least one point (amino acid of 0.05 wt % and the inhibitor of 0.08 wt %) a 5:8 ratio of amino acid/azole inhibitor compound.

In re claim 3, Lai et al. disclose the method wherein said barrier metal film is a

tantalum-based metal film (15, column 6, lines 28-33).

In re claim 4, he combined Lai et al. and Wang et al. disclose the method as claimed and rejected, but do not disclose the method wherein the amino acid is glycine.

Wang et al. disclose in another embodiment the method wherein said amino acid can be glycine (see [0045]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize glycine in the method of Wang et al. Wang et al. glycine is a known amino acid utilized in CMP slurries that allow for faster CMP of copper (see [0047]) and because it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

In re claim 6, Wang et al. disclose the method wherein a content of said triazole-based compound is not less than 0.05% by weight, but not greater than 0.5% by weight. For example, when amino acid 0.05 wt% and the inhibitor at 0.08 wt% reads on this limitation.

In re claims 7, 10, and 11, Wang et al. disclose the method wherein a pH value of said polishing slurry is in a range of 5 to 7 (see [0046], and Table 1, and Table 2) and further teaches the pH may be adjusted. The examiner notes that Applicant does not teach that the pH range solves any stated problem or is for any particular purpose. Therefore, the pH range lacks criticality in the claimed invention and does not produce unexpected or novel results. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the slurry with a pH range of 5-7 because Wang teaches any pH may be adjusted, and because it has been held that

where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233, MPEP 2144.05 II A.

In re claim 8, Wang et al. disclose the method wherein said silica polishing material is colloidal silica (see [0035]).

Response to Arguments

Applicant's arguments, see pages 7-9, filed May 26, 2005, with respect to the rejection of claims 1-4, and 6-8 have been fully considered and are persuasive. The rejection of claims 1-8, either alone or in combination has been withdrawn. Specifically, the examiner notes that Tsai et al. disclose the claimed percentages of triazole and amines in volume percentages, and to replace the triazole of Tsai et al. with the triazole of Watts et al. of a same volume would change the weight ratio, such that the claimed weight ratio of 5:8 would not be met.

Applicant's arguments filed May 26, 2005 with respect to the rejection of claims 1-8 with Sinha et al. have been fully considered but they are not persuasive. Applicants argue that the Sinha et al. does not disclose the triazole-based compounds as defined in the specification. The examiner notes that Watts et al. was relied upon to disclose the recited triazole component. Applicants further argue that Sinha et al. does not disclose the weight ratio as claimed. The examiner notes that Sinha et al. disclose the azole component to make up 0.05%-2% by weight and the amino acid to be 1%-10% of the weight of the slurry. Thus, Sinha et al. disclose at least one point (1wt % amino acid

to 1.6 wt % azole inhibitor compound) a 5:8 ratio of amino acid/azole inhibitor compound.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Kennedy whose telephone number is (571) 272-1672. The examiner can normally be reached on Mon.-Fri. 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Kennedy
Primary Examiner
Art Unit 2812

jmk